

Claims

1 1. A method of operating a file server, comprising the steps of:
2 receiving a CIFS request; and
3 recording state at that time about the request; and
4 restoring state upon reboot as last recorded; and
5 attempting to continue the CIFS session that the request was part of.

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8 2. The method of claim 1, wherein said step of receiving a CIFS request also includes
9 the steps of
10 acknowledging receipt of said CIFS request; and
11 processing said CIFS request.

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14 3. The method of claim 1, wherein said step of recording state includes determining
15 automatically whether the processing of a CIFS request is at a point where said state
16 can be reliably recorded.

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18 4. The method of claim 3, wherein said step of recording state occurs at points based on
19 the progress of processing of a CIFS request.

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21 5. The method of claim 4, wherein said state is recorded to a non-volatile storage

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23 6. The method of claim 1, wherein said step of recording state occurs as part of an
24 elective reboot or elective takeover of a server further comprising:
25 ignoring current CIFS requests;
26 processing all active CIFS requests; and

1 recording state.

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4 7. The method of claim 6, wherein all currently active requests are processed to

5 completion.

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7 8. The method of claim 1, wherein said step of recording state further comprises the

8 step of determining whether said server shutdown was elective or non-elective.

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10 9. The method of claim 8, wherein said step of determining whether said server

11 shutdown is elective or non-elective is a function of a flag value stored in said non-

12 volatile storage.

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14 10. The method of claim 9, wherein said flag value indicates said server shutdown was

15 elective.

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17 11. The method of claim 9, wherein said flag value indicates said server shutdown was

18 non-elective.

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20 12. The method of claim 1, wherein said step of recording state further comprises the

21 step of determining whether recovery will be accomplished by rebooting the affected

22 server or takeover by another server.

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24 13. The method of claim 12, wherein said step of determining whether recovery will be

25 accomplished by rebooting the affected server or takeover by another server is a

26 function of said flag value stored in said non-volatile storage.

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2 14. The method of claim 13, wherein said flag value indicates said recovery will be
3 accomplished by rebooting the affected server.

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5 15. The method of claim 13, wherein said flag value indicates said recovery will be
6 accomplished by takeover by another server.

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8 16. The method of claim 1, wherein said step of restoring state further comprises
9 determining whether recovery is by reboot or takeover by another server.

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11 17. The method of claim 16, wherein said step of determining whether recovery is
12 accomplished by reboot or takeover by another server is a function of said flag value
13 stored in said non-volatile storage.

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15 18. The method of claim 17, wherein said reboot comprises the steps of:
16 rebooting the affected server's operating system; and
17 rebuilding in-memory data structures to the state prior to said reboot.

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19 19. The method of claim 18, wherein said rebuilding in-memory data structures further
20 comprises fetching the state stored in said non-volatile storage to rebuild said in-
21 memory data structures.

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23 20. The method of claim 17, wherein said takeover comprises fetching the state stored in
24 the non-volatile storage and rebuilding said in-memory data structures in another
25 server using said state.

1 21. The method of claim 1, wherein said step of attempting to continue the CIFS session
2 that the request was part of further comprises the step of processing the remaining
3 portion of the uncompleted request.

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5 22. Apparatus including;
6 means for receiving a CIFS request; and
7 means for recording state at that time about the request; and
8 on reboot, restoring state as last recorded; and
9 means for attempting to continue the CIFS session that the request was part
10 of.

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12 23. The apparatus of claim 22, wherein said means for receiving a CIFS request includes
13 a means for acknowledging receipt of said CIFS request and a means for processing
14 the request.

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16 24. The apparatus of claim 22, wherein said means for recording state includes a means
17 to determine automatically whether the processing of a CIFS request is at a point
18 where said state can be reliably recorded.

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20 25. The apparatus of claim 24, wherein said means for recording state occurs at points
21 based on the progress of processing of a CIFS request.

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23 26. The apparatus of claim 25, wherein said state is recorded to a non-volatile storage

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25 27. The apparatus of claim 22, wherein said means for recording said state occurs as part
26 of an elective reboot or elective takeover of a server further comprising:

1 means for ignoring current CIFS requests;
2 means for processing all active CIFS requests; and
3 means for recording state.

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6 28. The apparatus of claim 27, wherein all currently active requests are processed to
7 completion.

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9 29. The apparatus of claim 22, wherein said means for recording state further comprises a
10 means for determining whether said server shutdown was elective or non-elective.

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12 30. The apparatus of claim 27, wherein said means for determining whether said server
13 shutdown was elective or non-elective is a function of a flag value stored in said non-
14 volatile storage.

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16 31. The apparatus of claim 30, wherein said flag value indicates said server shutdown
17 was elective.

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19 32. The apparatus of claim 30, wherein said flag value indicates said server shutdown
20 was non-elective.

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22 33. The apparatus of claim 22, wherein said means for recording state further comprises a
23 means for determining whether recovery will be accomplished by rebooting the
24 affected server or takeover by another server.

1 34. The apparatus of claim 33, wherein said means for determining whether recovery
2 will be accomplished by rebooting the affected server or takeover by another server is
3 a function of said flag value stored in said non-volatile storage.

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5 35. The apparatus of claim 34, wherein said flag value indicates said recovery will be
6 accomplished by rebooting the affected server.

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8 36. The apparatus of claim 34, wherein said flag value indicates said recovery will be
9 accomplished by takeover by another server.

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11 37. The apparatus of claim 22, wherein said means for restoring state further comprises
12 means for determining whether recovery is by reboot or takeover by another server.

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14 38. The apparatus of claim 37, wherein said means for determining whether recovery is
15 by reboot or takeover by another server is a function of said flag value stored in said
16 non-volatile storage.

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18 39. The apparatus of claim 38, wherein said reboot further comprises:
19 means for rebooting the affected server's operating system; and
20 means for rebuilding in-memory data structures to the state prior to said reboot.

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22 40. The apparatus of claim 39, wherein said means for rebuilding in-memory data
23 structures further comprises fetching the state stored in said non-volatile storage to
24 rebuild said in-memory data structures.

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1 41. The apparatus of claim 38, wherein said takeover comprises means for fetching the
2 state stored in said non-volatile storage and rebuilding said in-memory data structures
3 in another server using said state.

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5 42. The apparatus of claim 22, wherein said means for attempting to continue the CIFS
6 session that the request was part of further comprises a means for processing the
7 remaining portion of the uncompleted request.

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9 43. Non-volatile memory, said non-volatile memory having storage capable of holding
10 information, said information including;

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12 information identifying the state of a first device; and
13 information identifying a flag value.

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15 44. The apparatus of claim 43, wherein said flag value is capable of being interpreted to
16 indicate

17 rebooting said first device was an elective function;
18 rebooting said first device was a non-elective function;
19 takeover of said first device by a second device was an elective function;
20 and
21 takeover of said first device by said second device was a non-elective
22 function.

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